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THE MARINE BIOLOGICAL LABORATORY

TWENTY-FIRST REPORT; FOR THE YEAR 1918

THIRTY-FIRST YEAR

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I. TRUSTEES

EX OFFICIO

FRANK R. LILLIE, *Director*, The University of Chicago.

GILMAN A. DREW, *Assistant Director*, Marine Biological Laboratory.

D. BLAKELY HOAR, *Treasurer*, 161 Devonshire Street, Boston, Mass.

GARY N. CALKINS, *Clerk of the Corporation*, Columbia University.

TO SERVE UNTIL 1922

CORNELIA M. CLAPP, Mount Holyoke College.

E. G. CONKLIN, Princeton University.

ROSS G. HARRISON, Yale University.

CAMILLUS G. KIDDER, 27 William Street, New York City.

M. M. METCALF, Oberlin, Ohio.

WILLIAM PATTEN, Dartmouth College.

JACOB REIGHARD, University of Michigan.

W. B. SCOTT, Princeton University.

TO SERVE UNTIL 1921

S. F. CLARKE, Williamstown, Mass.

CHARLES A. COOLIDGE, Ames Building, Boston, Mass.

C. R. CRANE, Woods Hole, Mass., *President of the Corporation*.
ALFRED G. MAYOR, Carnegie Institution.
C. E. MCCLUNG, University of Pennsylvania.
T. H. MORGAN, Columbia University.
ERWIN F. SMITH, United States Department of Agriculture.
E. B. WILSON, Columbia University.

TO SERVE UNTIL 1920

H. H. DONALDSON, Wistar Institute of Anatomy and Biology.
M. J. GREENMAN, Wistar Institute of Anatomy and Biology.
C. W. HARGITT, Syracuse University.
H. S. JENNINGS, Johns Hopkins University.
GEORGE LEFEVRE, University of Missouri, *Secretary of the Board*.
A. P. MATHEWS, The University of Chicago.
G. H. PARKER, Harvard University.
HENRY B. WARD, University of Illinois.

TO SERVE UNTIL 1919

H. C. BUMPUS, Tufts College.
R. A. HARPER, Columbia University.
W. A. LOCY, Northwestern University.
JACQUES LOEB, The Rockefeller Institute for Medical Research.
GEORGE T. MOORE, Missouri Botanical Garden, St. Louis.
L. L. NUNN, Telluride, Colo.
W. J. V. OSTERHOUT, Harvard University.
JOHN C. PHILLIPS, 299 Berkeley Street, Boston, Mass.

II. ACT OF INCORPORATION

No. 3170.

COMMONWEALTH OF MASSACHUSETTS

Be It Known, That whereas Alpheus Hyatt, William Sanford Stevens, William T. Sedgwick, Edward G. Gardiner, Susan Minns, Charles Sedgwick Minot, Samuel Wells, William G. Farlow, Anna D. Phillips and B. H. Van Vleck have associated themselves with the intention of forming a Corporation under the name of the Marine Biological Laboratory, for the purpose of establishing and maintaining a laboratory or station for scientific study and investigation, and a school for instruction in biology and natural history, and have complied with the provisions of the statutes of this Commonwealth in such case made and provided, as appears from the certificate of the

President, Treasurer, and Trustees of said Corporation, duly approved by the Commissioner of Corporations, and recorded in this office;

Now, therefore, I, HENRY B. PIERCE, Secretary of the Commonwealth of Massachusetts, *do hereby certify* that said A. Hyatt, W. S. Stevens, W. T. Sedgwick, E. G. Gardiner, S. Minns, C. S. Minot, S. Wells, W. G. Farlow, A. D. Phillips, and B. H. Van Vleck, their associates and successors, are legally organized and established as, and are hereby made, an existing Corporation, under the name of the MARINE BIOLOGICAL LABORATORY, with the powers, rights, and privileges, and subject to the limitations, duties, and restrictions, which by law appertain thereto.

Witness my official signature hereunto subscribed, and the seal of the Commonwealth of Massachusetts hereunto affixed, this twentieth day of March, in the year of our LORD ONE THOUSAND, EIGHT HUNDRED and EIGHTY-EIGHT.

HENRY B. PIERCE,

[SEAL.]

Secretary of the Commonwealth.

III. BY-LAWS OF THE CORPORATION OF THE MARINE BIOLOGICAL LABORATORY

I. The annual meeting of the members shall be held on the second Tuesday in August, at the Laboratory, in Woods Hole, Mass., at 12 o'clock noon, in each year, and at such meeting the members shall choose by ballot a Treasurer and a Clerk, who shall be, *ex officio*, members of the Board of Trustees, and Trustees as hereinafter provided. At the annual meeting to be held in 1897, not more than twenty-four Trustees shall be chosen, who shall be divided into four classes, to serve one, two, three, and four years, respectively, and thereafter not more than eight Trustees shall be chosen annually for the term of four years. These officers shall hold their respective offices until others are chosen and qualified in their stead. The Director and Assistant Director, who shall be chosen by the Trustees, shall also be Trustees, *ex officio*.

II. Special meetings of the members may be called by the Trustees, to be held in Boston or in Woods Hole at such time and place as may be designated.

III. The Clerk shall give notice of meetings of the members by publication in some daily newspaper published in Boston at least fifteen days before such meeting, and in case of a special meeting the notice shall state the purpose for which it is called.

IV. Twenty-five members shall constitute a quorum at any meeting.

V. The Trustees shall have the control and management of the affairs of the Corporation; they shall present a report of its condition at every annual meeting; they shall elect one of their number President and may choose such other officers and agents as they may think best; they may fix the compensation and define the duties of all the officers and agents; and may remove them, or any of them, except those chosen by the members, at any time; they may fill vacancies occurring in any manner in their own number or in any of the offices. They shall from time to time elect members to the Corporation upon such terms and conditions as they may think best.

VI. Meetings of the Trustees shall be called by the President, or by any two Trustees, and the Secretary shall give notice thereof by written or printed notice sent to each Trustee by mail, postpaid. Seven Trustees shall constitute a quorum for the transaction of business. The Board of Trustees shall have power to choose an Executive Committee from their own number, and to delegate to such Committee such of their own powers as they may deem expedient.

VII. The President shall annually appoint two Trustees, who shall constitute a committee on finance, to examine from time to time the books and accounts of the Treasurer, and to audit his accounts at the close of the year. No investments of the funds of the Corporation shall be made by the Treasurer except approved by the finance committee in writing.

VIII. The consent of every Trustee shall be necessary to dissolution of the Marine Biological Laboratory. In case of dissolution, the property shall be given to the Boston Society of Natural History, or some similar public institution, on such terms as may then be agreed upon.

IX. These By-Laws may be altered at any meeting of the Trustees, provided that the notice of such meeting shall state that an alternation of the By-Laws will be acted upon.

X. Any member in good standing may vote at any meeting, either in person or by proxy duly executed.

IV. THE TREASURER'S REPORT

MARINE BIOLOGICAL LABORATORY BALANCE SHEET,
DECEMBER 31, 1918.

<i>Assets.</i>			
Cash in bank.....	\$ 7,503.52		
Petty cash at Woods Hole.....	200.00	\$	7,703.52
Notes receivable.....			1,000.00
Accounts receivable.....			10,938.88
Inventories (not available).....			
Items in suspense.....			11.73
Investments (Schedule I.).....	\$ 11,768.83		
Investment cash (Schedule II.).....	485.20		12,254.03
Gansett property account.....	\$ 22,317.20		
Less mortgage.....	14,629.21		7,687.99
Educational plant (Schedule III.):			
Land.....	\$95,856.14		
Buildings.....	169,670.49		
Equipment.....	75,920.25		
	\$341,446.88		
Less reserve for depreciation.....	21,140.24		320,306.64
			<u>\$359,902.79</u>
<i>Liabilities.</i>			
Bills payable.....		\$	90.58
Notes payable.....	\$ 2,300.00		
Trust funds.....	9,954.03		12,254.03
			<u>\$ 12,344.61</u>
Balancing account:			
Balance, January 1.....	\$254,157.31		
Special donations.....	1,261.59		
Sundry adjustments.....	6.79		
	<u>\$355,425.69</u>		
Less: Adjustment of depreciation reserve, 1917.....	\$ 5,209.01		
Excess of expenses for year.....	2,658.50		
		\$	<u>7,867.51</u>
			<u>\$347,558.18</u>
			<u>\$359,902.79</u>

MARINE BIOLOGICAL LABORATORY INCOME AND EXPENSES FOR
YEAR ENDED DECEMBER 31, 1918

	Expense	Income	Loss	Gain
Administrative expense.....	\$ 7,592.98		\$ 7,592.98	
Bar Neck property expense.....	80.00		80.00	

BIOLOGICAL BULLETIN and annual

dues.....	\$ 2,341.57	\$ 2,387.94	\$ 46.37
Boat department.....	6,378.42	6,378.42	
Carpenter department.....	868.35	21.52	846.83
Chemical department.....	1,436.27		1,436.27
Club House expense.....	196.91		196.91
Dexter House special expense.....	437.61		437.61
Dormitory department.....	1,589.98	1,528.76	61.22
Fish trap.....	1,323.62	1,360.10	36.48
Instruction.....	3,133.22	3,475.00	341.78
Interest on notes payable.....	150.00		150.00
Lectures, evening.....	122.14		122.14
Library department.....	1,492.70		1,492.70
Maintenance, buildings and grounds.	3,056.50		3,056.50
Mess.....	19,672.60	21,016.28	1,343.68
New laboratory expense.....	3,245.28		3,245.28
Newman cottage.....	49.19	175.00	125.81
Pumping station expense.....	378.07		378.07
Research department.....		3,050.00	3,050.00
Sundry expense and income.....	1,807.57	2,519.41	711.84
Supply department.....	13,304.60	18,748.04	5,443.44
Truck.....	1,029.56		1,029.56
Total current expenses.....	\$69,687.14	\$54,282.05	\$26,504.49
Total income.....	54,282.05		11,099.40
Excess of expenses.....	\$15,405.09		\$15,405.09
Depreciation.....	7,189.41		
Bad accounts charged off.....	64.00		
	\$22,658.50		
Contribution by Friendship Fund,			
Incorporated.....	20,000.00		
Balance to balancing account...	\$ 2,658.50		

MARINE BIOLOGICAL LABORATORY INVESTMENTS (BOOK
VALUES), DECEMBER 31, 1918.*Reserve Fund*

\$3,000 American Telephone & Telegraph Company, 4's (represented by receipts for same as collateral).....	\$2,921.25	
\$500 Western Telephone & Telegraph Company 5's.....	496.88	
6 shares American Smelting & Refining Company, Preferred (receipt on file).....	732.00	
8 shares General Electric Company.....	948.05	
14 shares United Shoe Machinery Company, Preferred....	393.75	
5 shares Massachusetts Gas Companies, Preferred.....	444.63	\$5,936.56

Lucretia Crocker Fund

\$300 Liberty Loan Bonds, 4¼'s.....	\$ 300.00
½ of \$1,000.00 American Telephone & Telegraph Company's 4's.....	194.75

18 shares Vermont and Massachusetts Railroad Company.	\$2,416.50	
1 share American Telephone & Telegraph Company.....	125.02	
3 shares General Electric Company.....	364.85	
1 share West End Street Railway Company.....	83.00	3,484.12

Library Fund

\$300 Liberty Loan Bonds, 4¼'s.....	\$ 300.00	
$\frac{4}{5}$ of \$1,000 American Telephone & Telegraph Company, 4's.	779.00	
3 shares American Telephone & Telegraph Company.....	375.04	
1 share American Smelting & Refining Company Preferred (receipt on file).....	122.00	
3 shares General Electric Company.....	362.10	
5 shares United Shoe Machinery Company, Preferred.....	140.63	
3 shares Massachusetts Gas Companies, Preferred.....	269.38	\$2,348.15
Total, Exhibit A.....		\$11,768.83

HARVEY S. CHASE & COMPANY CERTIFIED PUBLIC ACCOUNTANTS,
84 STATE ST., BOSTON

MR. D. BLAKELEY HOAR,
161 Devonshire Street,
Boston.

February 11, 1919

Dear Sir: We have completed our audit of the accounts of the Marine Biological Laboratory for the year ended December 31, 1918, as kept both at your office in Boston and at Woods Hole, and report thereon in the accompanying exhibits and schedules:

Exhibit A—Balance-Sheet as of December 31, 1918.

B—Income-and-Expense for the year ended December 31, 1918.

Schedule I—Investments (Book Values).

II—Cash Receipts and Payments on account of Investments.

III—Summary of Inventory of Land, Buildings and Equipment.

IV—Depreciation Reserve.

We certify that, subject to the comments herewith, the balance-sheet and income-and-expense statement shown in Exhibits A and B are in accordance with the books and correct to the best of our knowledge and belief.

Very respectfully,
HARVEY S. CHASE & COMPANY,
Certified Public Accountants.

V. STATEMENT CONCERNING THE LIBRARY

On account of the exceptional conditions of the state of war, it was found impossible to carry out any external enterprise, and in the absence of the assistant librarian, other work was limited. For these reasons the main effort was devoted to extension of the catalogues. In addition, a number of gifts were accessioned. Among these must be mentioned the gift by Miss Katharine Foot of about 750 reprints from her collection, especially rich in cytology, and the gift by Dr. Ida H. Hyde of a most valuable collection of about 1,900 books and reprints on physiological subjects. These gifts are particularly valuable as they constitute research collections including many rare publications at least two thirds of which are new to the Library. The coöperation of investigators has been a most important factor in building up the library.

VI. THE DIRECTOR'S REPORT

January 1, 1919

TO THE TRUSTEES OF THE MARINE BIOLOGICAL LABORATORY:

Gentlemen: I beg to present herewith a report of the thirty-first session of the Marine Biological Laboratory for the year 1918. Our anticipation both last season and this, that the war would affect our regular work unfavorably has been to a certain extent realized. But the conclusion of the war nevertheless finds us in a strong position, with our organization intact, and no actual suspension of our work incurred in spite of a considerable diminution of it.

If we examine the tabular view of attendance given under 3 beyond, we find that the total attendance for the last four years was: 1915, 242; 1916, 231; 1917, 212; 1918, 161. The attendance of investigators during the same period was cut down from 137 to 92, and of students from 105 to 69. The greatest proportional loss was among the younger investigators, whose numbers were reduced to less than one half. This is explained by the fact that the young men were serving our country in

various technical capacities. There was a corresponding reduction in receipts from students and investigators: 1915, \$8,325; 1916, \$8,725; 1917, \$7,850; 1918, \$6,530. The receipts of the Supply Department were \$18,748.04 as against \$18,815.22 in 1917; \$21,096.65 in 1916; and \$16,932.00 in 1915.

It was possible to effect various economies corresponding to the somewhat smaller scale of operations, and the treasurer's report shows a net excess of receipts over expenditures for the year amounting to \$4,594.91. Out of total expenditures of \$69,687.14, Mr. Crane furnished \$20,000.00 through the Friendship Fund, Inc., for which our best thanks seem singularly inadequate. The name of the Fund expresses the spirit of the giver, and the spirit of the Laboratory toward Mr. and Mrs. Crane in ever increasing degree if that is possible.

As stated in the last annual report,¹ shortly after beginning of the war the Laboratory leased to the United States of America for the Navy Department without compensation, the Mess-hall, laundry, kitchen and storehouse, the Homestead and the lecture hall building from September 15, 1917, to May 15, 1918. On the conclusion of this period the lease was renewed, with certain adjustments to cover the summer session, until June 30, 1919. The Navy Department so coöperated with us that we were able to continue our work without interruption. During the summer of 1918, the members of the Naval Reserve at Woods Hole were furnished board at the Mess which was run by the Laboratory as usual, and at the close of the summer session the Navy Department took it over again. The plan worked harmoniously, and I feel we owe an acknowledgment to the Navy personnel for the courtesy with which all elements of the situation were invariably met. Of the 200 members of the Naval Reserve at Woods Hole, one half was furnished board at the Mess while the other half was on duty with the boats, and these sections alternated. Owing to conclusion of the armistice, the lease will be terminated from and after January 31, 1919.

The Laboratory is glad to have made the above small contribution to the winning of the war. Many of the members of the staff, the Board of Trustees, and of the Corporation have been

¹ BIOLOGICAL BULLETIN, Vol. 35, p. 142.

concerned in war work, some by enlistment in various branches of the armed forces of the United States, others by service on various scientific boards, others again by undertaking specific pieces of investigation for the Government. As a consequence there were many absences from the staff and investigators in the summer. Those who were able to do so took up the work of the absent members, and recognition is due for the efficiency with which they conducted the work of the Laboratory.

The Tablet in memory of the First Director of the Laboratory was designed by Miss Frances Grimes of New York City, and was completed and set up in the vestibule of the brick building in the spring of 1918. It is of bronze, and bears the following inscription: "To the Memory of Charles Otis Whitman, 1842-1910, Professor of Zoölogy in Universities of Japan and the United States, 1877-1910. First Director of the Marine Biological Laboratory, 1888-1908. This tablet is erected by the Corporation and Board of Trustees of the Marine Biological Laboratory in grateful recognition of his inspiring Leadership, Devotion to the Spirit of Coöperation among Scientific Men, high ideals of Research, and of his great work in the Advancement of Biological Science."

May this memorial serve to keep green the memory of the man who more than any other, established the spirit of the Marine Biological Laboratory:

The death of Franklin P. Mall, Professor of Anatomy in Johns Hopkins Medical School occasioned a serious loss to the Laboratory. The following resolution has been entered in the minutes of the Board of Trustees:

"Franklin Paine Mall died at Baltimore, November 17, 1917, in his fifty-sixth year and just as he was entering on the most comprehensive phase of his work in human embryology.

"Since 1897 he had been a member of the Board of Trustees of the Marine Biological Laboratory.

"The aims and ideals of the Laboratory were close to his heart, and many young investigators who have studied at Woods Hole owe to his suggestion their impulse to do this.

"A student of broad biological training and still broader interests; a teacher of genius; a skilful organizer of scientific

work and workers; an investigator with a peculiar gift for the appreciation of form and with a strong artistic sense; a whimsical counsellor, blending wise sayings with his common talk. . . . This Board owes much to him, and on this occasion desires to record its sorrow for his too early death and its appreciation of his qualities."

The vacancy in the Board of Trustees caused by the death of Professor Mall has been filled by the election of W. J. V. Osterhaut, Professor of Botany in Harvard University.

We record with sorrow the death from pneumonia on January 29, 1919, of Professor William E. Kellicott, head of the Department of Biology of the College of the City of New York and of the Department of Embryology of the Marine Biological Laboratory. During his long connection with our Laboratory, as investigator in 1903, instructor in embryology 1908-1914, and head of this department since 1915, Professor Kellicott won many friends and rendered most valuable service. His loss will be deeply felt by his friends and by the Laboratory.

War conditions prevented any considerable development of the Gansett property in 1918. The plans stated in the last report were however carried through. The Town of Falmouth accepted the main road (Whitman Road) and part of Gansett Road, which are now town roads, and purchased the water system installed by the Laboratory on these roads at cost. Two residences have been erected. The Laboratory has paid off \$1,781.60 on the mortgage, and holds to the credit of the Gansett account \$2,522.66 in cash, and a mortgage of \$1000.00 on two of the lots with residence.

The Laboratory has come through a period of serious uncertainty without harm. Now that this period of suspense is over, we are confronted with an opportunity for usefulness greater by all that has been lost by Europe in the matter of scientific usefulness, and by the spirit of heightened scientific activity that has been aroused in America during the stirring times of war. It is perhaps not so much an opportunity as a duty to see that American institutions of learning compensate the world to some extent for what has been lost. In our field of work this duty and this opportunity are ours.

I. THE STAFF

1918

THE STAFF

FRANK R. LILLIE, *Director*, Professor of Embryology, and Chairman of the Department of Zoölogy, The University of Chicago.

GILMAN A. DREW, *Assistant Director*, Marine Biological Laboratory.

ZOOLOGY

I. INVESTIGATION

GARY N. CALKINS, Professor of Protozoölogy, Columbia University.

E. G. CONKLIN, Professor of Zoölogy, Princeton University.

GILMAN A. DREW, Assistant Director, Marine Biological Laboratory.

GEORGE LEFEVRE, Professor of Zoölogy, The University of Missouri.

FRANK R. LILLIE, Professor of Embryology, The University of Chicago.

C. E. MCCLUNG, Professor of Zoölogy, University of Pennsylvania.

T. H. MORGAN, Professor of Experimental Zoölogy, Columbia University.

E. B. WILSON, Professor of Zoölogy, Columbia University.

II. INSTRUCTION

CASWELL GRAVE, Associate Professor of Zoölogy, Johns Hopkins University. (Absent in 1918.)

W. C. ALLEE, Professor of Biology, Lake Forest College. In charge in 1918.

GEORGE A. BAITSELL, Instructor in Biology, Yale University. (Absent in 1918.)

ROBERT CHAMBERS, JR., Cornell University Medical College.

G. S. DODDS, Assistant Professor of Zoölogy, University of Missouri.

W. J. KOSTIR, Instructor in Zoölogy and Entomology, Ohio State University.

ANN H. MORGAN, Professor of Zoölogy, Mount Holyoke College.

CHARLES L. PARMENTER, Research Fellow, University of Pennsylvania.

EMBRYOLOGY

I. INVESTIGATION

(See Zoölogy)

II. INSTRUCTION

WILLIAM E. KELLICOTT, Professor of Biology, Goucher College (absent in 1918.)

ROBERT A. BUDINGTON, Professor of Zoölogy, Oberlin College,
(In charge in 1918.)

CHARLES G. ROGERS, Professor of Comparative Physiology, Oberlin
College.

HUBERT B. GOODRICH, Associate Professor of Zoölogy, Wesleyan
University.

PHYSIOLOGY

I. INVESTIGATION

ALBERT P. MATHEWS, Professor of Physiological Chemistry, The
University of Chicago. (Absent in 1918.)

RALPH S. LILLIE, Professor of Biology, Clark University.

HAROLD C. BRADLEY, Assistant Professor of Physiological Chemistry.
University of Wisconsin.

II. INSTRUCTION

RALPH S. LILLIE, Professor of Biology, Clark University.

WALTER E. GARREY, Professor of Physiology, Tulane University.
(Absent in 1918.)

FRANK P. KNOWLTON, Professor of Physiology, Syracuse University.

A. R. MOORE, Professor of Physiology, Rutgers College.

PHILOSOPHICAL ASPECTS OF BIOLOGY AND ALLIED SCIENCES

LECTURES

EDWARD G. SPAULDING, Professor of Philosophy, Princeton University.
(Absent in 1918.)

BOTANY

GEORGE T. MOORE, Director, Missouri Botanical Garden and Pro-
fessor of Botany, Washington University.

IVEY F. LEWIS, Professor of Biology, University of Virginia.

WILLIAM D. HOYT, Associate Professor of Biology, Washington and
Lee University.

LIBRARY

H. MCE. KNOWER, Professor of Anatomy, University of Cincinnati.
Librarian.

MARY E. SCOTT, Assistant Librarian.

CHEMICAL SUPPLIES¹

OLIVER S. STRONG, Assistant Professor of Neurology, College of
Physicians and Surgeons, New York City, Chemist.

¹ Compound microscopes, with two oculars and two objectives, rack and pinion
and fine adjustment, may be rented for the season at \$7.00 each provided notice
is received by the assistant director not later than June 15.

SUPPLY DEPARTMENT

G. M. GRAY, Curator.	A. M. HILTON, Collector.
JOHN J. VEEDER, Captain.	J. McINNIS, Collector.
E. M. LEWIS, Engineer.	F. G. GUSTAFSON, Collector in
A. W. LEATHERS, Collector.	Botany.
EDNA E. WELLS, Clerk.	

F. M. MACNAUGHT, Business Manager.

HERBERT A. HILTON, Superintendent of Buildings and Grounds.

2. INVESTIGATORS AND STUDENTS

1918

ZOOLOGY

Independent Investigators

- ADDISON, WILLIAM H. F., Assistant Professor of Normal Histology and Embryology, University of Pennsylvania.
- ALLEE, WARDER C., Professor of Biology, Lake Forest College.
- ALLEN, EZRA, Research Fellow, University of Pennsylvania.
- ALTENBURG, EDGAR, Instructor in Biology, Rice Institute.
- ANDO, HIDEZO, University of Kyoto, Japan.
- BECKWITH, CORA J., Associate Professor of Zoölogy, Vassar College.
- BIGNEY, Andrew J., Assistant in Zoölogy, Harvard University.
- BORING, ALICE M., Associate Professor of Zoölogy, University of Maine.
- BRIDGES, CALVIN B., Research Assistant, Columbia University.
- BUDINGTON, ROBERT A., Professor of Zoölogy, Oberlin College.
- CALKINS, GARY N., Professor of Protozoölogy, Columbia University.
- CAROTHERS, E. ELEANOR, Assistant in Zoölogy, University of Pennsylvania.
- CLAPP, Cornelia M., Emeritus Professor of Zoölogy, Mount Holyoke College.
- CLARK, ELIOT R., Professor of Anatomy, University of Missouri.
- CLARK, ELEANOR L., Columbia, Mo.
- COPELAND, MANTON, Professor of Biology, Bowdoin College.
- COWDRY, Edmund V., Professor of Anatomy, Peking Union Medical College.
- CRAMPTON, H. E., Professor of Zoölogy, Barnard College.
- DEXTER, JOHN S., Assistant Professor of Zoölogy, University of Saskatchewan.
- DODDS, GIDEON S., Assistant Professor of Zoölogy, University of Missouri.
- DONALDSON, HENRY H., Professor of Neurology, Wistar Institute.
- DREW, GILMAN A., Assistant Director, Marine Biological Laboratory, Woods Hole.
- GLASER, OTTO C., Professor of Biology, Amherst, Mass.
- GOODRICH, HUBERT B., Associate Professor of Zoölogy, Wesleyan University.
- GOULD, HARLEY N., Assistant Professor, West Virginia University Medical School.
- GREGORY, Louise H., Assistant Professor of Zoölogy, Barnard College.
- KINDRED, JAMES E., Graduate Fellow, University of Illinois.
- KNOWER, HENRY MCE., Professor of Anatomy, University of Cincinnati.
- LILLIE, Frank R., Chairman Department of Zoölogy, University of Chicago.

- McCLUNG, CLARENCE E., Director of Zoölogical Laboratory, University of Pennsylvania.
- MOHR, OTTO L., Prosector, University of Kristiania.
- MINER, ROY W., Associate Curator of Invertebrate Zoölogy, American Museum of Natural History.
- MORGAN, ANN H., Professor of Zoölogy, Mount Holyoke College.
- MORGAN, THOMAS H., Professor of Experimental Zoölogy, Columbia University.
- MORRILL, CHARLES V., Instructor in Anatomy, Cornell Medical College.
- MULLER, HERMANN J., Instructor, Rice Institute.
- NABOURS, ROBERT K., Professor of Zoölogy, Kansas Agricultural College.
- PACKARD, CHARLES, Instructor in Zoölogy, Columbia University.
- PARKER, GEORGE H., Professor of Zoölogy, Harvard University.
- PARMENTER, CHARLES L., Research Fellow, University of Pennsylvania.
- PATTEN, WILLIAM, Professor of Biology, Dartmouth College.
- PATTEN, BRADLEY M., Assistant Professor of Histology and Embryology, Western Reserve University.
- PLOUGH, HAROLD H., Instructor in Biology, Amherst College.
- ROGERS, CHARLES G., Professor of Comparative Physiology, Oberlin College.
- STOCKARD, CHARLES R., Professor of Anatomy, Cornell University Medical College.
- STRONG, OLIVER S., Assistant Professor of Neurology, Columbia University.
- STURTEVANT, ALFRED H., Research Assistant, Columbia University.
- WARREN, HOWARD C., Stuart Professor of Psychology, Princeton University.
- WHITING, PHINEAS W., Harrison Research in Zoölogy, University of Pennsylvania.
- WILSON, EDMUND B., Professor of Zoölogy, Columbia University.
- WOODWARD, ALVALYN E., Instructor, Simmons College.

Beginning Investigators

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- CARLSON, C. O., Professor of Biology, Doane College.
- COLLETT, MARY E., Fellow in Zoölogy, University of Pennsylvania.
- DAVIES, I. J., Technician, Rice Institute.
- DONOVAN, STEPHEN M., Professor of Biology, St. Bonaventure's College.
- GOODRICH, CLARA C., Middletown, Conn.
- HEDGE, MABEL L., Technician, Columbia University.
- HOWLAND, RUTH B., Associate Professor of Biology, Sweet Briar College.
- KOSTIR, W. J., Instructor in Zoölogy, Ohio State University.
- MATSUI, KENKICHI, Agricultural College of Morioka, Japan.
- NONIDEZ, JOSE, F., Professor of Zoölogy, University of Murcia, Spain.
- OLSEN, CHRIS E., Preparator, American Museum of Natural History.
- SCHRADER, FRANZ, Assistant, Columbia University.
- SHIMOTORI, SHOW, Artist, American Museum of Natural History.
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- WALLACE, EDITH M., Research Assistant, Columbia University.

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- CHAMBERS, ROBERT JR., Instructor in Anatomy, Cornell University Medical College.
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DERNBY, KARL G., Rockefeller Institute.

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JUST, ERNEST E., Professor of Physiology, Howard University.

KNOWLTON, FRANK P., Professor of Physiology, Syracuse University.

LILLIE, RALPH S., Professor of Biology, Clark University.

LOEB, JACQUES, Head of Department of Experimental Biology, Rockefeller Institute for Medical Research.

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IRWIN, MARIAN, Graduate Student, Radcliffe College.

BOTANY

Independent Investigators

EAST, EDWARD M., Professor Experimental Plant Morphology, Harvard University.

HOYT, WILLIAM D., Associate Professor of Biology, Washington and Lee University.

LEWIS, IVEY F., Professor of Biology, University of Virginia.

MOORE, GEORGE T., Director, Missouri Botanical Garden.

OSTERHOUT, WINTHROP J. V., Professor of Botany, Harvard University.

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THOMAS, HELEN S., Radcliffe College.

STUDENTS

1918

ZOÖLOGY

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CLOSSON, MARY B., Student, Ursinus College.

COLCORD, Edward C., Student, Oberlin College.

DABOLL, MARY, Student, Mount Holyoke College.

EBELING, KARL W., Student, Johns Hopkins University.
ELLIOTT, Grace E., Knox College.
FLAIG, Julian V., Student, Princeton University.
GATES, GORDON E., Student, Colby College.
GREENE, Charlotte L., Student, Barnard College.
HANSON, FRANK B., Instructor, Washington University.
HYDE, ALICE, Student, Mount Holyoke College.
JONES, HAROLD E., Assistant, Amherst College.
KOERNER, SOPHIE, Student, Barnard College.
KRAFKA, Elizabeth B., Laboratory Assistant, Lake Forest College.
KRANZ, ALETHA, Student, University of Chicago.
LAGEMANN, ANNA E., Student, Barnard College.
LILLIE, CATHERINE C., Student, Vassar College.
LUPO, PATSY, Mount Holyoke College.
McCASH, GLADYS K., Student, Mount Holyoke College.
McCLAY, EDITH L., Student, Mount Holyoke College.
MASON, ELEANOR D., Student, Mount Holyoke College.
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METCALF, RACHEL V., Oberlin College.
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MULLINS, MARY R., Hunter College.
OAK, DOROTHY, Student, Barnard College.
POLK, REBEKA, Student, Mount Holyoke College.
POWIS, ETHEL M., Student, Mount Holyoke College.
PRICE, GENEVIEVE, Student, Oberlin College.
SEAYER, CHARLOTTE, Sweet Briar College.
SHONKA, EMIL F., Student, St. Procopius College.
STEWART, WALTER B., Student, Princeton University.
THOMPSON, MARTHA L., Student, Knox College.
TROTTER, MILDRED, Student, Mount Holyoke College.
WHEATLEY, MARJORIE A., Student, Vassar College.
WHITE, FRANCES W., Student, Oberlin College.
WILLMANN, EDITH, Student, Barnard College.

EMBRYOLOGY

ABT, ARTHUR F., Student, University of Chicago.
AGERSBOG, H. P. K., Tutor, College of City of New York.
BROWN, ALICE L., Assistant Instructor, University of Kansas.
CAULDWELL, KATHARINE, Student, Bryn Mawr College.
HOSFORD, CAROLINE A., Instructor in Zoölogy, Doane College.
HUGHES, SALLY P., Instructor, Grinnell College.
HUGHES, J. ARTHUR, Student, Carleton College.
MILLER, ERWIN C., Student, Dartmouth College.
NORRIS, HENRY M., Student, Princeton University.
SEAGO, MARY M., Student, Sophie Newcomb College.
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BASKERVILL, MARGARET L., Instructor in Biology, Mississippi Industrial Institute and College.

BROKAW, EUNICE, Student, Knox College.

FULTON, B. B., Assistant Entomologist, New York Agricultural Experiment Station.

GREEN, SUSAN A., Professor of Biology, Maryville College.

HINRICHS, MARIE A., Student, University of Chicago.

HOLLAND, DOROTHY F., Mount Holyoke College.

MARTIN, BERTHA E., Assistant Professor of Biology, Wheaton College.

MONTGOMERY, PRISCILLA B., University of Pennsylvania.

SPENCER, HELEN W., Student, Radcliffe College.

STRESEMAN, ADELE E., Instructor in Physics, Vassar College.

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FESSENDEN, ANNA P., Smith College.

FOUTS, JANET W., Barnard College.

JEWETT, GLADYS E., Student, Wheaton College.

TUTTLE, GURYNETH, M., Instructor in Botany, University of Alberta.

3. TABULAR VIEW OF ATTENDANCE

	1914	1915	1916	1917	1918
INVESTIGATORS—Total.....	129	137	129	129	93
Independent:					
Zoölogy.....	62	69	70	63	51
Physiology.....	22	20	23	23	16
Botany.....	10	6	7	8	5
Under Instruction:					
Zoölogy.....	31	36	25	24	16
Physiology.....	1	4	3	6	3
Botany.....	3	2	1	5	2
STUDENTS—Total.....	89	105	102	83	69
Zoölogy.....	43	47	50	46	41
Embryology.....	21	37	26	16	12
Physiology.....	10	15	14	13	10
Botany.....	15	6	12	8	6
TOTAL ATTENDANCE.....	218	242	231	212	162
INSTITUTIONS REPRESENTED—Total.....	77	79	73	77	72
By investigators.....	51	59	51	60	49
By students.....	47	42	45	36	38
SCHOOLS AND ACADEMIES REPRESENTED.					
By investigators.....	1	3	—	2	—
By students.....	5	9	3	5	—

4. SUBSCRIBING INSTITUTIONS—1918

AMHERST COLLEGE
BARNARD COLLEGE
BRYN MAWR COLLEGE
CARLETON COLLEGE
COLUMBIA UNIVERSITY
CORNELL UNIVERSITY MEDICAL COLLEGE
CREIGHTON UNIVERSITY
DARTMOUTH COLLEGE
ELSE SERINGHAUS SCHOLARSHIP, HUNTER COLLEGE, NEW YORK
CITY
GOUCHER COLLEGE
HARVARD UNIVERSITY
HARVARD UNIVERSITY MEDICAL SCHOOL
JOHNS HOPKINS UNIVERSITY
KANSAS STATE AGRICULTURAL COLLEGE
LAKE FOREST COLLEGE
MOUNT HOLYOKE COLLEGE
OBERLIN COLLEGE
PRINCETON UNIVERSITY
RADCLIFFE COLLEGE
RICE INSTITUTE
ROCKEFELLER INSTITUTE FOR MEDICAL RESEARCH
SMITH COLLEGE
SOPHIE NEWCOMB COLLEGE
UNIVERSITY OF CHICAGO
UNIVERSITY OF ILLINOIS
UNIVERSITY OF KANSAS
UNIVERSITY OF MICHIGAN
UNIVERSITY OF PENNSYLVANIA
UNIVERSITY OF WISCONSIN
VASSAR COLLEGE
WHEATON COLLEGE
WISTAR INSTITUTE OF ANATOMY AND BIOLOGY
YALE UNIVERSITY

SCHOLARSHIP TABLES

LUCRETIA CROCKER SCHOLARSHIPS FOR TEACHERS IN BOSTON
SCHOLARSHIP OF \$100, SUPPORTED BY A FRIEND OF THE LABORATORY
SINCE 1898.

5. EVENING LECTURES, 1918

Friday, July 5,

PROF. E. M. EAST..... "The Phenomenon of Self-Sterility."

Tuesday, July 9,

PROF. W. J. V. OSTERHOUT .. "Photosynthesis."

Friday, July 12,

PROF. JACQUES LOEB..... "Why Does Mutilation of an Organism Induce Regeneration?"

Tuesday, July 16,

DR. S. O. MAST..... "Problems, Methods and Results in Behavior."

Friday, July 19,

PROF. T. H. MORGAN..... "Secondary Sexual Characters, Sex-linked Characters and Gynandromorphs."

Tuesday, July 23.

DR. JULES DUESBERG..... "Mitochondria."

Friday, July 26,

DR. R. S. LILLIE..... "Nature of Protoplasmic Transmission."

Tuesday, July 30,

DR. ROY W. MINER..... "From Tidal Zone to Museum."

Friday, Aug. 2,

DR. GARY N. CALKINS..... "*Uroleptus mobilis* and the Problem of Conjugation."

Tuesday, Aug. 6,

PROF. W. M. WHEELER..... "The Life History and Behavior of the Worm-lion."

Friday, Aug. 9,

DR. J. ARTHUR HARRIS..... "Mathematics in Biology."

Tuesday, Aug. 13,

PROF. ROSS G. HARRISON.... "Experiments on the Development of Limbs."

6. MEMBERS OF THE CORPORATION

LIFE MEMBERS

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- CAREY, MR. ARTHUR ASTOR, Fayerweather St., Boston, Mass.
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N. J.
CRANE, MR. C. R., Woods Hole, Mass.
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KIDDER, MR. NATHANIEL T., Milton, Mass.
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MORGAN, MRS. T. H., New York City, N. Y.
NOYES, MISS EVA J.

- NUNN, MR. LUCIAN L., Telluride, Colo.
OSBORN, PROF. HENRY F., American Museum of Natural History, New York City, N. Y.
PHILLIPS, DR. JOHN C., Windy Knob, Wenham, Mass.
PHILLIPS, MRS. JOHN C., Windy Knob, Wenham, Mass.
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WILSON, PROF. W. P., Commercial Museum, Philadelphia, Pa.

7. CORPORATION MEMBERSHIP LIST

AUGUST, 1918

- ABBOTT, PROF. J. F., Washington University, St. Louis, Mo.
ADDISON, DR. W. H. F., University of Pennsylvania Medical School, Philadelphia, Pa.
ADAMS, MISS A. E., Mount Holyoke College, South Hadley, Mass.
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BAITSELL, DR. GEORGE A., Yale University, New Haven, Conn.

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BEYER, DR. H. G., The Marlborough, Washington, D. C.

BIGELOW, PROF. M. A., Teachers College, Columbia University, New York City.

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BINFORD, DR. RAYMOND, Earlham College, Richmond, Ind.

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- CATTELL, PROF. J. McKEEN, Garrison-on-Hudson, N. Y.
- CATTELL, MR. McKEEN, Garrison-on-Hudson, N. Y.
- CHAMBERS, DR. ROBERT, JR., Cornell University Medical College, New York City, N. Y.
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- CHIDESTER, PROF. F. E., Rutgers College, New Brunswick, N. J.
- CHILD, PROF. C. M., University of Chicago, Chicago, Ill.
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- CLARK, PROF. E. R., University of Missouri' Columbia, Mo.
- CLOWES, DR. G. H. A., State Cancer Laboratory, Buffalo, N. Y.
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- DAVIS, MR. DONALD W., College of William and Mary, Williamsburg, Va.
- DAVIS, PROF. BRADLEY M., University of Pennsylvania, Philadelphia, Pa.
- DERICK, PROF. CARRIE M., McGill University, Montreal, Canada.
- DEXTER, DR. J. S., University of Saskatchewan, Saskatoon, Saskatchewan.
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JENNER, PROF. E. A., Simpson College, Indianola, Iowa.

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JONES, PROF. LYND, Oberlin College, Oberlin, Ohio.

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LEWIS, PROF. I. F., University of Virginia, University, Va.

LEWIS, PROF. W. H., Johns Hopkins University, Baltimore, Md.

LILLIE, PROF. FRANK R., University of Chicago, Chicago, Ill.

LILLIE, PROF. R. S., Clark University, Worcester, Mass.

LINTON, PROF. EDWIN, Washington and Jefferson College, Washington, Pa.

LOEB, PROF. JACQUES, Rockefeller Institute for Medical Research, New York City, N. Y.

LOEB, PROF. LEO, Washington University Medical School, St. Louis, Mo.

LOWTHER, MRS. FLORENCE DEL., Barnard College, Columbia University, New York City, N. Y.

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MCINDOO, DR. N. E., Bureau of Entomology, Washington, D. C.

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